Notre Dame
de
Budapest
Pipe Organ Samples
User's Guide

Notre Dame de Budapest

Pipe Organ Samples

Full Edition

for GigaStudio 2 and 3

User's Manual

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Table of contents

At a glance 4
Installation Guide 5
- What's in the box 5
- Hardware and software requirements 6
- Setting up NDB for GigaStudio 3 – running the installation wizard[v3] 8
- Fine-tuning GigaStudio 3[v3] 9
- Notes for users of different GigaStudio 3 editions[v3] 10
- Setting up NDB for GigaStudio 2.x 11

Users' Manual 12
The library 12
Effects 12
- Natural cathedral reverb 12
- Swellbox 14
- Swellbox by convolution (SWL)[v3] 14
- Swellbox by recorded samples (SW) 15
- Tremolo (TRM) 15
- Crescendos 15
- Contents of the disks[v3] 16
- Detailed registration of the stops and combinations in the library 17
- NDB_SFX – Special effects 21

Registration tips 23
Important notes and remarks 27
- Files installed in the root directory of NDB[v3] 27
- Notes on GigaPulse[v3] 28
- Notes on the convolution swellbox (SWL) function[v3] 28
- Notes on the Crescendos 29
- About the iMIDI rules[v3] 29
- Troubleshooting – Before you contact us 29
- Support 30

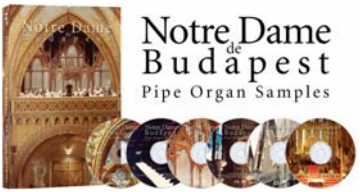
'Notre Dame de Buda', Matthias-Church, Budapest 31
- Factsheet of the organ 32

'Notre Dame de Kispest', Budapest 35
- Factsheet of the organ 35

About the pipe organ 37
- History of the pipe organ 37
- Parts, mechanism, and sound production 38
- The recording and editing process 43
- Some interesting facts about NDB 45

Organ stops 46
Tuning information 48
Legal issues 51
Credits 52

At a glance



Notre Dame de Budapest Pipe Organ Samples (NDB) is the largest sampling library that contains pipe organ sound samples in GigaStudio format. It features the sound of two symphonic organs from two famous Hungarian cathedrals with an unmatched level of authenticity. Both cathedrals have 'Our Lady' in their names – that's where the name 'Notre Dame' comes from.

While it is still impossible to reproduce electronically all the fine details and the various aspects of playing an organ, we managed to reach an extremely high level of authenticity – you can play these organs almost as if you were playing the original ones at the cathedral.

Together with many serious organists and pipe organ experts, we have carefully selected and captured all important stops and combinations for you and your studio. We recorded practically every important part of a pipe organ, even the noises of the inner cathedral and the organ engine itself. As part of the real beauty of the organ comes from the interference of the individual pipe sounds, it is very difficult, if worth at all, to use loops. Therefore, almost all notes of the stops were sampled with a length of 30 to 40 seconds, which resulted in a huge amount of data: rich pipe organ sounds with the natural reverb of the cathedrals, with all interferences at the organ case, all sound transients… like never before.

You can also play the stops located in the swellbox using the sweller pedal. You can turn on the tremolo effect on the appropriate stops (e.g. on *Bourdon 8'*). You have real crescendo, just like on a real pipe organ. With this collection of stops and combinations, you can play every organ piece from the organ literature, from pre-baroque to post-modern.

This new version of the library you are holding now, created especially for GigaStudio 3, features 48 kHz/24-bit samples and many of the new functions GigaStudio offers: iMIDI advanced release sample tracking, multiple integrated GigaPulse convolution reverbs and swellbox characteristics – just to mention a few.

Installation Guide

What's in the box

Versions and editions

NDB Pipe Organ Samples comes in two versions. One was created for Tascam GigaStudio 3, which features 48 kHz, 24-bit sounds and uses many of the special functions of the new GigaStudio. The other version, which was prepared for backward compatibility with Tascam GigaStudio 2.x, has exactly the same stops and combinations, but it contains 16-bit sounds and naturally lacks some features that only GigaStudio 3 (and thus *NDBv3*) can offer.

Note: While most of the contents you find here is valid for both versions, throughout this manual you will see a small v3 superscript (like this[v3]) when we describe information only applicable to NDBv3. If you are holding the 16-bit version of NDB, you can safely skip these chapters.

To make sure you have received a complete product, please ensure you have the following contents in the box:

NDB 24-bit Full Edition for GigaStudio 3:

- 6 DVDs in 3 double disk holder jewel cases
- NDB User's Manual
- Your personal DVD-key in the inner side of the jewel cases

NDB 16-bit Full Edition for GigaStudio 2.x:

- 4 DVDs in 2 double disk holder jewel cases
- NDB User's Manual
- Your personal DVD-key in the inner side of the jewel cases

Note: The setup wizard asks for the DVD-key when you are installing the 24-bit version. You can register your copy of *NDB* using your DVD-key at the NDB website: *http://support.ndb.hu.*

Hardware and software requirements

NDB Pipe Organ Samples were created for the sampler software TASCAM GigaStudio 3 and 2.x and are published in various editions. Below we list the minimum and recommended configurations for the 16 and 24-bit versions.

Hardware

Minimum requirements of the 24-bit samples (GigaStudio 3.x)

CPU:	Pentium 4 1700 MHz or AMD 2100 XP, SSE-compatible processor for GigaPulse
RAM:	512 MB
Sound card:	Sound card with GSIF support or ReWire-compatible host application (such as Cubase SX, Nuendo, Pro Tools, Sonar, etc.)
Disk space:	23 GB
Additional devices:	DVD-ROM, MIDI interface

Minimum requirements of the 16-bit samples (GigaStudio 2.x)

CPU:	Pentium II or AMD equivalent
RAM:	256 MB
Sound card:	Sound card with GSIF 1.0 or DirectSound (DirectSound only under Windows 9x)
Disk space:	16 GB
Additional devices:	DVD-ROM, MIDI interface

Recommended configuration for the 24-bit samples (GigaStudio 3.x)

CPU:	Pentium 4 2.4 GHz or AMD 3200 XP or faster, SSE-compatible processor for GigaPulse
RAM:	2 GB or more to load all samples simultaneously
Sound card:	Sound card with GSIF 2 support or ReWire-compatible host application (such as Cubase SX, Nuendo, Pro Tools, Sonar, etc.)
Disk space:	23 GB
Additional devices:	DVD-ROM, MIDI interface with modulation wheel and foot controller, MIDI-compatible pipe organ pedal-board

Recommended configuration for the Full Edition for GigaStudio 2.x

CPU:	Pentium 4 or AMD equivalent or faster
RAM:	512 MB or more to load all samples simultaneously
Sound Card:	Sound card with GSIF 1.0 or above
Disk Space:	16 GB
Additional devices:	DVD-ROM, MIDI interface with modulation wheel and foot controller, MIDI-compatible pipe organ pedal-board

Software

Minimum requirements

Operating system:	Windows XP Professional with SP1 installed for GigaStudio 3.x Windows 98 SE/ME/2000/XP for running GigaStudio 2.x
Sampler software:	TASCAM GigaStudio 3.x Ensemble or Solo TASCAM GigaStudio 2.x 96 or 32*

*NDB can be used with these products but you may experience severe polyphony underrun.

Recommended configuration

Operating system:	Windows XP Professional with SP2 (or later) installed latest device drivers
Sampler software:	TASCAM GigaStudio 3.x Orchestra TASCAM GigaStudio 2.x 160

Notes on the hardware and software configuration

CPU: Use a fast CPU because slower ones decrease the maximum polyphony you can play.

Note: GigaPulse uses quite a fair amount of the CPU; unless you have at least a Pentium 4 2.4 GHz or faster processor, you are unlikely to be able to use comfortably the 7-channel reverb.

RAM: Put as much RAM in your computer as you can as it limits the maximum capacity of the samples which you can load into the sampler software simultaneously. 1 GB of RAM or more is seriously recommended.

Sound card: GigaStudio 3.0 runs only on Windows XP SP1 (or later) and needs a GSIF compatible sound card or a ReWire compatible host application to generate sound. For further information consult the Tascam GigaStudio website (*www.tascamgiga.com*).
GigaStudio 2.x can operate without a GSIF compatible sound card with a DirectSound emulation, but only under Windows 98, 98SE and Windows ME.

Hard disk: For good performance, we recommend using a high-speed hard disk dedicated for only the sample data. *NDB* needs about 23 GB of disk space on your hard drive. It is recommended to have at least a 7200rpm hard disk with a maximum of 8-9 ms seek time; however, SCSI is not required, ATA and SATA drives will do just fine. Stripe RAID is recommended for even better performance. If you have a recent computer model, you should not worry much about this; if not, you might experience delays, clicks or misses in the sound and you may wish to upgrade your system.

Additional devices: To use all the features of NDB Pipe Organ Samples in real time – in other words, to perform live –, you will need a MIDI-keyboard

with additional modulation wheel controller and foot pedal (expression controller pedal). You may also want to play the pedal notes with a real pipe-organ pedal. If you are looking for a real wooden pipe-organ MIDI pedal from a master organ builder, please visit *http://www.ndb.hu/pedal*.

Software configuration: If you are running GigaStudio 3, please make sure that you have the latest device drivers, especially of your video card, and you have a minimum screen resolution of 1024x768.

Tip: Check TASCAM's recommendations as well on their support site.

Setting up NDB for GigaStudio 3 – running the installation wizard[v3]

Because of the large number of files and the large amount of data, to make the installation process simple and smooth, *NDB Pipe Organ Samples* comes with its own installer application.

If you have the AutoPlay function enabled on your DVD-ROM drive, the *NDB Pipe Organ Samples* installer wizard should start automatically. If it does not, you can start it manually by running X:\Setup.exe, where *X* is the drive letter for your DVD-ROM drive.

Note: Please exit all applications when you are installing NDB, especially GigaStudio 3.

Follow the prompts of the installer wizard and replace the disks when prompted. The installation process should be simple and smooth.

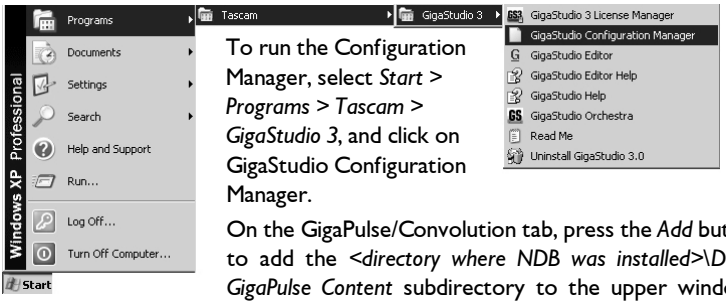
Should you have problems during the installation, please refer to the troubleshooting section in this Manual.

As the installation media includes only data files like **setup-1a.bin,** it is not possible either to run the samples from the DVD disks or to copy the instruments manually. It is possible, though, to copy all setup files to the hard drive and run the setup program from there if you want NDB install a bit faster.

Tip: It may also be a good idea to do some defragmentation, because a fragmented disk seriously affects the performance of GigaStudio.

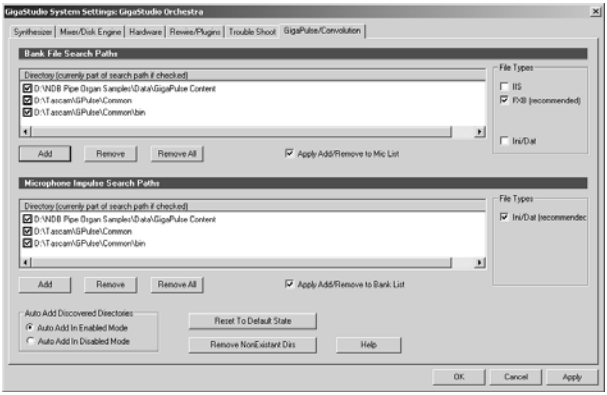
Fine-tuning GigaStudio 3[v3]

Step 1. Before you start GigaStudio 3, run the GigaStudio Configuration Manager.



To run the Configuration Manager, select *Start* > *Programs* > *Tascam* > *GigaStudio 3*, and click on GigaStudio Configuration Manager.

On the GigaPulse/Convolution tab, press the *Add* button to add the *<directory where NDB was installed>\Data\ GigaPulse Content* subdirectory to the upper windows (Bank File Search Paths). If everything happened correctly, you should have the window look like this:



Press the *Apply*, then the *OK* button.

Step 2. Start GigaStudio 3 now. Go to GigaStudio settings. On the QuickSound tab select *Rebuild entire QuickSound database now*. Press the *Advanced* button, then select *.gig, .gsp, .gx?, .gsi*. Also select the drive where you installed *NDB Pipe Organ Samples*. Then select *Save Settings* and update your QuickSound database. This step is required in order to be able to load instruments with the .gsi files.

Step 3. Restart GigaStudio 3.

Notes for users of different GigaStudio 3 editions[v3]

GigaStudio 3 Orchestra

NDB was originally designed and made for GigaStudio 3 Orchestra. Every function of the library works smoothly and produces the best performance with this edition of GigaStudio 3. We recommend using GigaStudio 3 Orchestra.

GigaStudio 3 Ensemble, Solo and OEM

NDB works a bit different under these editions of GigaStudio 3. First of all, you probably do not have GigaPulse Pro which originally ships with GigaStudio 3 Orchestra, but you probably have GigaPulse SP. In SP, you cannot set the parameters as precisely as in the Pro version, but the result you can hear is quite similar. Also, the GigaPulse SP effect probably does not show up in the DSP Station in GigaStudio. This means that you cannot add GigaPulse as an insert effect to your performance.

As NDB implements the cathedral reverbs by GigaPulse effects, you will not be able to add them as an insert effect, but luckily, there is an alternative solution: the FX Instance instruments.

Setting up the convolution cathedral reverbs

In GigaStudio 3 Ensemble, Solo and OEM, you have only the following option to setup the cathedral reverb and swellbox effect.

Step 1. First of all, you will need to enable instrument stacking. You can do this by clicking on the appropriate icon in the Loader Pane.

Step 2. Drag or load the .gsi file of the effect (reverb/swellbox) you wish to use.

Note: You can identify the .gsi files that load GigaPulse effects easily: they all have 'FX Instance Instrument' in their name. You can find these .gsi files in the root of the NDB folder.

For example, drag *NDB Cathedral Reverb (factory Stereo) - FX Instance Instrument.gsi* to an empty channel.

Step 3. Now drag or load an instrument to the same channel where the GigaPulse effect was loaded. If you have done everything correctly, you

should have a stacked instrument on that channel, and the two members of the stack are the reverb and the instrument, like this:

You might have noticed that there is a green 'FX' button near the loaded reverb. You can adjust the setting of the reverb by clicking the arrow near that button and then clicking on the preset name *NDB Cathedral (Stereo)* or the one you have loaded.

Setting up NDB for GigaStudio 2.x

Step 1. Make a folder (directory) on your hard disk and make sure you have at least 16 GB of disk space there.

Step 2. Copy the contents of each disk to the folder you created in Step 1.

Users' Manual

The library

Together with many serious organists, pipe organ experts, and based on the response of our users, we tried to include almost every important part of a pipe organ in *NDB Pipe Organ Samples*. You can hear the natural reverb of the cathedrals, tremolo of some stops, crescendo, the swellbox; what's more, even the sound of the organ engine, valves and the registration.

The voice of a pipe organ is not something you can take a 3-second sample of and then loop it: it is a full web of transients, from the sound of the mechanical action and valves through the venting of air chambers to the voices of the pipe itself. Our experiments clearly showed that the recorded samples have to be at least 15 to 20 seconds long to capture their actual voice, and even longer, if we want them to use in music. For these very reasons, as an average, every second note of all manual stops was sampled with a 30-second length. To avoid annoying stops when playing long pedal notes, all pedal notes are a full one minute long – most of them are true one-minute samples; there are only a few ones we artificially made to be a minute long. We indeed had a limited time in the busy cathedral to record what we wanted to.

Effects

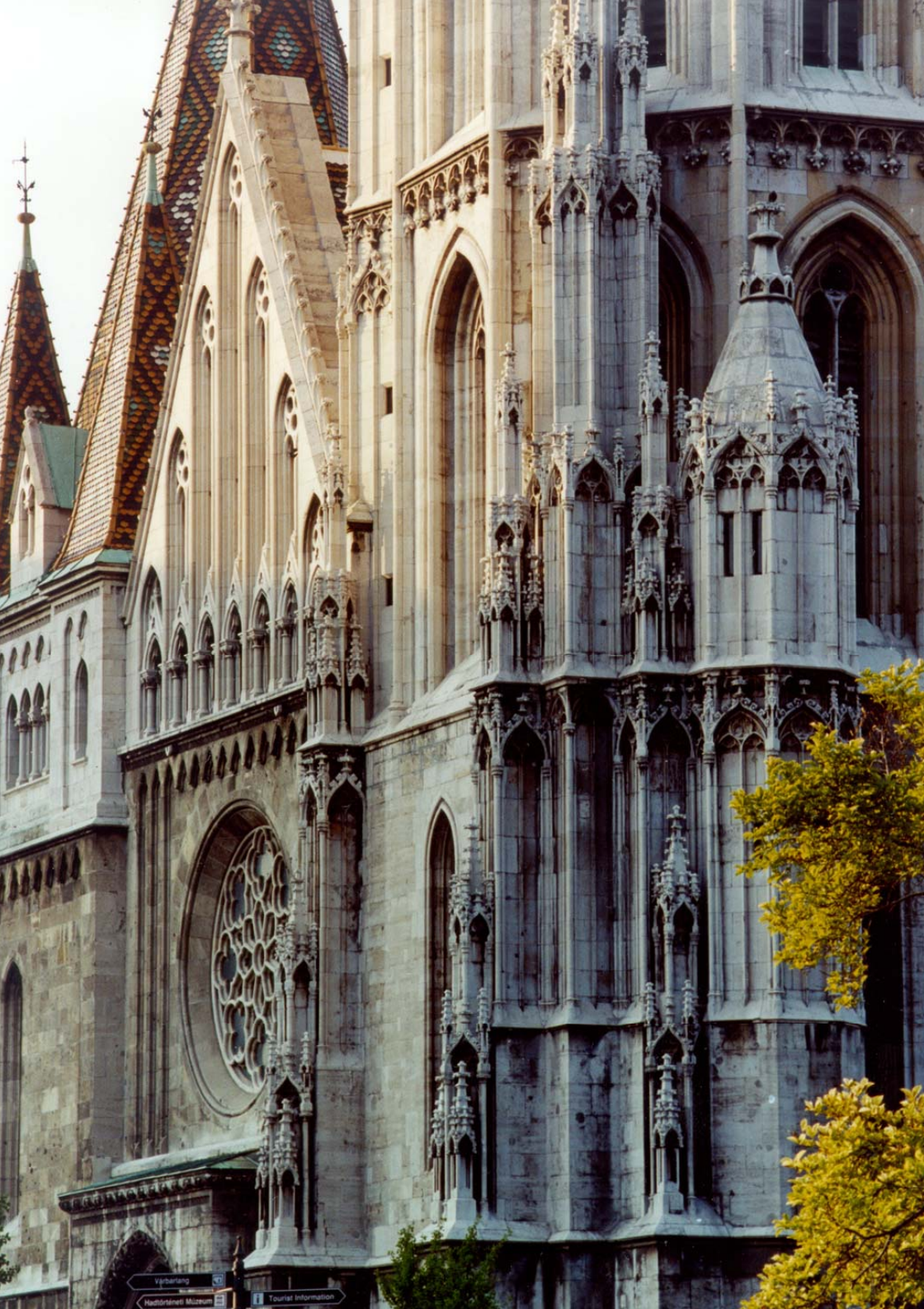
In order to come as close to real organ playing as possible, the organ samples in *NDB* include a large number of effects. There are two methods to reproduce the natural reverb of the cathedrals; also you can switch on the tremolo on some stops, use crescendo, and control the swellbox. Below we give an overview of these effects.

Natural cathedral reverb

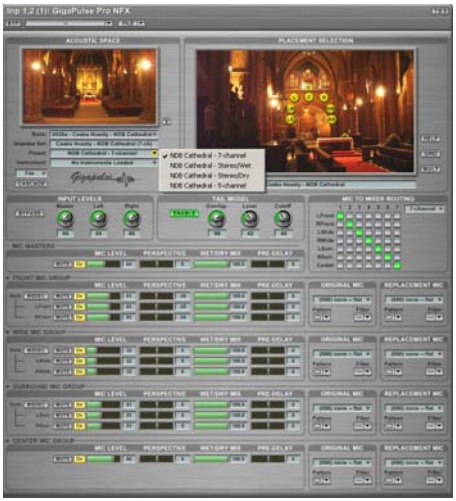
NDB Pipe Organ Samples feature the natural cathedral reverbs of the acoustic spaces where the organs are located. The reverb effect is realized in two different ways.

GigaPulse convolution reverbs[v3]

The natural reverb of an acoustic space can be represented by its impulse response. In other words, by measuring the impulse response of the acoustic space, it is possible to calculate the reverb of any sound source – how that given sound would reverb in that space.


Várbarlang
Hadtörténeti Múzeum
Tourist Information

We measured carefully the impulse responses of both cathedrals, using various microphone setups and measuring methods. Using GigaPulse, the impulse response reverb module of GigaStudio, you can add these natural reverbs to any desired source of audio. The reverb is calculated by GigaPulse each time a note is played back – it is hard to get it sound any more realistic. The amount of the reverb (the distance of the listener from the organ) can be freely adjusted – again, in real time – or can even be turned off, in case you want to add a different ambience than the real one.



NDB features two completely new banks in addition to the GigaPulse factory "*0028 – Csaba Huszty – NDB Cathedral*" stereo reverb. The two other reverbs – installed to the GigaPulse Content folder under where NDB is installed on your computer – include a 7-channel cathedral reverb and a stereo reverb from the two cathedrals. The 7-channel reverb has one 5-channel and two stereo presets too. You will find these reverbs when you browse your GigaPulse presets.

Tip: You can also load these reverbs with their appropriate knob settings of the DSP Station to GigaStudio using the .GSP files you find under the root directory of where you installed NDB. These .GSP files will load only under GigaStudio 3.0 Orchestra, and were created so that you do not have to wiggle dozens of knobs every time.

Release sample reverbs (RT)

On some recordings it might be important to preserve the acoustic environment in which the samples were recorded. Another method for this is to simply record everything that is heard in the cathedral when the notes are hit and released. Though when they are transformed to release samples they will not sound as realistic as the convolution reverbs – especially on staccato notes – we did keep this type of reverb as well, just in case you need them.

The amount – volume – of the release sample reverb is freely adjustable, in real time. By default it is turned on for all instruments that has (RT) in their file name. It is possible to turn it off by setting the MIDI controller 94 (FX 4 in GigaStudio) to any

value below 64. As the release samples are fairly long compared to other acoustic spaces (the reverbs decay usually over 4 seconds), a fast piece can quickly eat up polyphony so sometimes you may wish to turn the reverb off and use convolution reverb instead.

Changing values of MIDI controller 91 (FX 1 in GigaStudio) from 0 to 127 will mix the reverb volume from maximum to minimum. The reverb is exactly the same what you hear in the church after releasing the 30-second note.

You may also add more reverb to the samples while you are not turning off the release samples – feel free to experiment.

Swellbox

The swellbox is a very important part of the organ – vital, if you are playing romantic or modern pieces. It contains the pipes of certain stops and by opening its shutters you can gradually increase the loudness and brightness of the sound of organ. This effect works perfectly in NDB Pipe Organ Samples and is achieved in two different ways.

Swellbox by convolution (SWL)[v3]

It is possible to measure the acoustic characteristics of the swellbox, and model the box as a filter to the sound. We represented the filter characteristics by its impulse response and let GigaPulse calculate the effect on the appropriate stops. The measurement method was designed so that the cathedral reverb – although was recorded – did not show up in the resulted impulse response. See more on this at the Publications section on the NDB website.

The GigaPulse effect was then programmed with a MIDI automation so that you can control the amount of mixing (the amount you open the swellbox) by adjusting the Foot (4) MIDI controller.

Note: You can always reprogram this MIDI automation by right-clicking on the slider under the Wet/Dry Mix label.

Swellbox by recorded samples (SW)

The other way to realize a working swellbox effect is to record the original sound, both when the box was opened and closed and then control GigaStudio to mix the sound whenever you are adjusting the sweller pedal.

Adjusting the foot controller (4), most practically by an expression pedal, from value 0 to 127, the swellbox gradually closes, as on real organs. This means, most naturally, that the default state of the swellbox is opened at the lower position of the sweller pedal (so-called 'French-style sweller'). Check the table below for the availability on several stops of this effect.

Tremolo (TRM)

The tremolo (*tremulant*) is a very well-known effect in a pipe organ. For certain combinations, where tremolos are very often used, such as *Voix Céleste,* the recorded sound samples contain the tremolo effect, so it is impossible to switch it off (these combinations are marked by *Trem.* in the *Stops used in the combination* column in the table below). For other stops, where the player may freely decide to use tremolo or not, depending on the organ piece performed, we have added a MIDI controller-based tremolo engine to turn the effect on or off. This is done by adjusting the Breath Controller (MIDI Controller 2) from value 0 (no tremolo) to 127 (maximum tremolo). By default it is turned off.

Crescendos

The crescendo is also a popular effect and is used often in rehearsals and improvisations, where the organist has no time or possibility to prepare the registration. By gradually rotating a cylinder or adjusting a pedal by foot, stops start turning on, which results in crescendos (and decrescendos) in the sound. For a real-time effect, the foot controller (4) controls this effect as well, and works very much like the swellbox effect. By default, the state of the crescendo is in the quiet position. Crescendos in this edition are 4-state effects with accurate dynamic settings. They were created using half the number of the host sample sets to save polyphony and are located in different – Crescendo – GIG files. The Crescendos are as follows:

Crescendo 1:	from Notre Dame de Buda
Crescendo 2:	from Notre Dame de Kispest
Crescendo 1 Pedal:	from Notre Dame de Buda
Crescendo 2 Pedal:	from Notre Dame de Kispest

Dynamics and velocity settings

If you only use one stop of the library at the time, feel free to set its velocity where it best suits you and your piece. However, when creating a more complex piece with lots of combinations, we recommend using velocity settings close to our listed values if you want to have the dynamics of the real instrument.

Contents of the disks[v3]

The installer wizard installs the following files on your machine (you can specify the destination directory or use the default *NDB Pipe Organ Samples*):

```
\<destination directory>
   .gsp files for the effects
   .gsi files for the effects
   \Data
      .chm help files
      \Special Effects
         .gig files (actual sample data)
      \GigaPulse Content
         .gig files (GigaPulse FX Instance Instruments)
         .fxb files (GigaPulse bank files)
         .iis files (GigaPulse impulse data files)
      \Notre Dame de Buda
         .gig files (actual sample data)
         .gx99 files (encoded GigaPulse impulse data files*)
      \Notre Dame de Kispest
         .gig files (actual sample data)
         .gx99 files (encoded GigaPulse impulse data files*)
   \Notre Dame de Buda
      .gsi files for loading the .gig instruments
   \Notre Dame de Kispest
      .gsi files for loading the .gig instruments
```

---

* **Warning:** Do not remove or rename these files or the host .gig files will not load.

Below we list all the stops and combinations included in *NDB Pipe Organ Samples*. A little explanation about the abbreviations used in the program names (NDB refers to the name of the library) showing where – on which manual – the stop or combination was originally located in the real instrument or the type of the sound:

- POS – Positive
- GRO – Grand-Orgue
- GPR – Grand-Orgue with Positive and Récit coupled
- REC – Récit
- BRW – Brustwerk
- PED – Pedal
- SFX – Special effects
- TRN – 'artificial' stops/combinations created by transposition* (e.g. Quint 1 1/3' using the 1' samples)
- CRS – crescendo instruments

* There are no such .GIG files; they are only programs within certain .GIG files

Detailed registration of the stops and combinations in the library

In the table below we list every stop and combination that is included on the disk, their special effects, their recommended velocity settings for the proper representation of the organ's dynamics and some useful information where they can be used optimally.

Notre Dame de Buda

Combination name	Stops used in the combination	Volume	Possible music appli-cation	Extra fea-tures
NDB_BRW - Gedackt 8'	Gedackt 8'	47	all	RT
NDB_BRW - Glocken	Glocken	86	all	RT
NDB_BRW - Krummhorn 8'	Krummhorn 8'	58	all	RT
NDB_BRW - Plenum	Gedackt 8', Quintatön 8', Spitzflöte 4',.Principal 2', Larigot 1 1/3' , Octave 1'	73	all	RT
NDB_BRW - Tutti	Gedackt 8', Quintatön 8', Spitzflöte 4', Principal 2', Larigot 1 1/3', Octave 1', Obertön 3x1 1/7', Zimbel 3x 2/3', Sordun 16', Krummhorn 8'	82	all	RT
NDB_GPR - Anches 16' 8' 4' Sub + Super	All reed pipes + Sub + Super	112	all	RT
NDB_GPR - Flutes, Bourdon, Gemshorn + Rohrflote 4'	V. man.: Flûte harmonique 8' IV. man.: Gedackt 8' III. man.: Bourdon á chem., Flûte traversiére, Gambe 8' II. man.: Gemshorn 8' + Rohrflöte 4'	59	all	RT
NDB_GPR - Flutes, Bourdon, Gemshorn	V. man.: Flûte harmonique 8' IV. man.: Gedackt 8' III. man.: Bourdon á chem., Flûte traversiére, Gambe 8' II. man.: Gemshorn 8'	48	all	RT
NDB_GPR - Fonds + Quint	Fonds 8',Quint 2 2/3'	77	baroque	RT
NDB_GPR - Fonds 16' 8' 4'	Fonds 16' 8' 4'	76	all	RT
NDB_GPR - Fonds 16' 8'	Fonds 16' 8'	73	all	RT
NDB_GPR - Fonds 8' 4'	Fonds 8' 4'	67	all	RT
NDB_GPR - Fonds 8'	Fonds 8'	67	all	RT
NDB_GPR - Gemshorn 8' + Nachthorn 8' + Rohrflote 4'	Gemshorn 8' + Nachthorn 8' + Rohrflöte 4'	55	all	RT
NDB_GPR - Mixtures +	Fonds 8' 4' 2', Mixtur 5x1 1/3', Mixtur	110	baroque	RT

Combination name	Stops used in the combination	Volume	Possible music appli-cation	Extra fea-tures
Trompete 8'	5x2', Cornet3–5x 8', Cornet 3–4x2 2/3', Zimbel 3x2/3', Trompete 8'			
NDB_GPR - Mixtures	Fonds 8' 4' 2',Mixtur 5x1 1/3'	80	baroque	RT
NDB_GPR - Tutti + Chamade 8'	Tutti + Chamade 8'	110	all	RT
NDB_GRO - Octave 1'	Octave 1'	50	all	RT
NDB_GRO - Praestant 8'	Praestant 8'	57	all	RT
NDB_PED - Fonds + Quint	Fonds 16' 8', P+I, P+II	70	baroque	RT
NDB_PED - Fonds 16' 8'	Fonds 16' 8'	66	all	RT
NDB_PED - Fonds 16'	Fonds 16'	66	all	RT
NDB_PED - Fonds 32'	Fonds 32'	70	baroque	RT
NDB_PED - Plenum Bassoon 16'	Fonds 16' 8' 4', Bassoon 16'	90	baroque	RT
NDB_PED - Plenum Posaune 16'	Fonds 16' 8' 4', Posaune 16'	110	baroque	RT
NDB_PED - Subbass 16'	Subbass 16'	60	baroque	RT
NDB_PED - Tutti + Chamade 8'	Tutti + Chamade 8'	127	all	RT
NDB_PED - Violon 16'	Violon 16'	55	all	RT
NDB_POS - Chamade 8'	Chamade 8'	106	all	RT
NDB_POS - Fonds 8' 4'	Fonds 8' 4'	69	baroque	RT
NDB_POS - Fonds 8'	Fonds 8'	69	baroque	RT
NDB_POS - Principal 8'	Principal 8'	62	all	RT
NDB_POS - Scharff	Fonds 8' 4', Scharff 5x5 1/3'	67	baroque	RT
NDB_POS - Sesquialtera	Fonds 8', Nasat 2 2/3', Terz 1 1/3'	67	baroque	RT, TRM
NDB_REC - Anches 16' 8' 4'	Anches 16' 8' 4'	96	romantic, modern	RT
NDB_REC - Bassoon 16'	Bassoon 16'	70	all	RT, SWL
NDB_REC - Clairon 4'	Clairon 4'	65	all	RT, SWL
NDB_REC - Flute Traversiére	Flûte traversiére 8', Bourdon á cheminèe 8', Flûte harmonique 8', Trem.	56	romantic, modern	RT
NDB_REC - Hautbois 8'	Hautbois 8'	68	romantic, modern	RT, SW, SWL, TRM
NDB_REC - Principal 8'	Principal 8'	50	all	RT
NDB_REC - Trompete Harmonique 8'	Trompete Harmonique 8'	65	all	RT

Combination name	Stops used in the combination	Volume	Possible music appli-cation	Extra fea-tures
NDB_REC - Voix Humaine 8'	Voix Humaine 8'	44	romantic, modern	RT, SWL
NDB_TRN - Terz I 3/5'	transposed stop from Octave I'	50	all	RT
NDB_TRN - Quint I 1/3'	transposed stop from Octave I'	50	all	RT
NDB_SFX - Valves	Valve noise of the Positive	70	-	-

Notre Dame de Kispest

Combination name	Stops used in the combination	Volume	Possible music appli-cation	Extra fea-tures
NDB_GPR - Anches 16' 8' 4'	I. man.: Trompette 8', Clarinette 8', I+II , I+II sub, I+II super II. man.: Trompette harmonique 8', Basson-hautbois 8', Clairon 4', Sub II, Super II	77	baroque	RT
NDB_GPR - Cornet	Cornet 5x	60	all	RT
NDB_GPR – Mixtures + Bassoon Hautbois 8'	I. man.: Fonds 8' 4', Mixtur 5-7x II. man.: Diapason 8', Nasard 2 2/3', Tierce I 3/5', Basson– hautbois 8', Mixtur 3-5x	60	all	RT
NDB_GPR - Tutti	Gen. Tutti	110	all	RT
NDB_GRO - Fonds 16' 8' 4'	Fonds 16' 8' 4'	63	all	RT
NDB_GRO - Fonds 8' 4' 2' + Mixtur 5-7x	I. man,: Fonds 8' 4' 2', Mixtur 5-7x	50	baroque	RT
NDB_GRO - Fonds 8' 4' 2' + Mixtures	I. man.: Praestant 8', Bourdon 8', Salicional 8', Octave 4', Doublette 2', Mixtur 5-7x, I+II II. man.: Diapason 8', Bourdon 8', Dulcian 4', Flûte octaviante 4', Nasard 2 2/3', Octavin 2', Mixtur 3-5x	63	baroque	RT
NDB_GRO - Octave 4'	Octave 4'	28	all	RT
NDB_GRO - Trompete 8'	Trompete 8'	60	all	RT
NDB_PED - Fonds 16' 8' (Subbass 16')	Fonds 16' 8' Ped.	66	all	RT
NDB_PED - Fonds 16' 8' + Bombarde 16'	Fonds 16' 8', Bombarde 16'	75	all	RT

Combination name	Stops used in the combination	Volume	Possible music appli-cation	Extra fea-tures
NDB_PED - Fonds 16' 8' 4' 2' + Mixtures	I. man.: Praestant 8', Bourdon 8', Salicional 8', Octave 4', Doublette 2', Mixtur 5-7x II. man.: Diapason 8', Bourdon 8', Dulcian 4', Flûte octaviante 4', Nasard 2 2/3', Octavin 2', Mixtur 3-5x Ped.: Fonds 16' 8' 4', P+I, P+II	63	baroque	RT
NDB_PED – Tutti	Gen. Tutti Ped.	127	all	RT
NDB_POS - Bourdon 8'	I. man.: Bourdon 8',, I+II II. man.: Bourdon 8'	50	all	RT, TRM
NDB_POS - Fonds 8' 4' 2' + Mixtures	II. man.: Diapason 8', Bourdon 8', Dulcian 4', Flûte octaviante 4', Nasard 2 2/3', Octavin 2', Mixtur 3-5x	48	baroque	RT
NDB_POS - Mixtures + Bassoon Hautbois 8'	Diapason 8', Nasard 2 2/3', Tierce I 3/5', Basson– hautbois 8', Mixtur 3-5x	60	all	RT
NDB_REC - Clarinet 8'	Clarinette 8'	60	all	RT, SW, SWL, TRM
NDB_REC - Flute Harmonique 8'	Flûte harmonique 8'	50	romantic, modern	RT
NDB_REC - Fonds 8' 4' + Unda Maris 8'	II. man.: Fonds 8' 4' + Unda Maris 8'	54	all	RT
NDB_REC - Fonds 8' 4'	II. man.: Fonds 8' 4'	50	all	RT
NDB_REC - Voix Céleste	II. man.: Voix Céleste 8', Gambe 8', Unda maris 8'	40	romantic, modern	RT, SW, SWL

NDB_SFX – Special effects

In order to reach the highest level of authenticity we recorded some noises that frequently occur while playing the organ and heard inside the cathedral and also some beautiful bell sounds of the cathedrals heard outside. Feel free to use them to make your recordings more realistic or make it sound like if it was recorded live.

Note: Please consult the legal issues in this document about creating recordings with NDB Pipe Organ Samples.

The *Special effects.gig* file contains several different 'instruments':

NDB_SFX – Organ Engines (TR)

This instrument contains the looped organ engine sound of both organs, which you can add to your recordings.

Tip: This organ engine sound was completely removed from each sampled note so that the engine noise does not add up with the stops and combinations you are playing. Adding it *once* to your recording in the background will make it sound more authentic.

Tip: For movie sound score application: add the engine noise only if the scene is inside the cathedral.

Some of these engine sounds come with Tremolo so that you can switch to the tremolo-ed organ engine sound, if you use tremolo combinations. The instrument includes the following sounds:

- c3: Turning on the organ of Notre Dame de Kispest (engine sound looped, tremolo possible)
- d3: Turning off the organ of Notre Dame de Kispest
- e3: Organ engine of Notre Dame de Kispest (looped, tremolo possible)
- f3: Turning on the organ of Notre Dame de Buda (engine sound looped)
- g3: Turning off the organ of Notre Dame de Buda
- a3: Organ engine of Notre Dame de Buda (looped, tremolo possible)
- c4: Mass registration sound of the organ at Notre Dame de Buda – pushing the Tutti piston
- c#4: Mass registration sound of the organ at Notre Dame de Buda – pushing the zero piston from Tutti
- d4: Mass registration sound of the organ at Notre Dame de Buda – pushing the zero piston from fewer stops
- d#4: Mass registration sound of the organ at Notre Dame de Buda – Variant 1
- e4: Mass registration sound of the organ at Notre Dame de Buda – Variant 2
- f4: Mass registration sound of the organ at Notre Dame de Buda – Variant 3
- f#4: Mass registration sound of the organ at Notre Dame de Buda – Variant 4

g4: Mass registration sound of the organ at Notre Dame de Buda – Variant 5
g#4: Mass registration sound of the organ at Notre Dame de Buda – Variant 6
a4: Mass registration sound of the organ at Notre Dame de Buda – Variant 7
a#4: Mass registration sound of the organ at Notre Dame de Buda – Variant 8
c5: Registration switch sound on the registration panel of the organ of Notre Dame de Buda
c#5: Registration switch sound on the registration panel of the organ of Notre Dame de Buda
d5: Registration switch sound on the registration panel of the organ of Notre Dame de Buda
f5: Lots of valves go down when playing notes on the Positive at the organ of Notre Dame de Buda
g5: Lots of valves come up when playing notes on the Positive at the organ of Notre Dame de Buda
a5: Stops turning on when gradually turning the crescendo wheel at the organ of Notre Dame de Buda
a#5: Swellbox shutters opening at the organ of Notre Dame de Buda
b5: Swellbox shutters closing loudly at the organ of Notre Dame de Buda
c6: Swellbox shutters opening at the organ of Notre Dame de Kispest
c#6: Swellbox shutters closing loudly at the organ of Notre Dame de Kispest
d6: The organist gets off the organ bench at Notre Dame de Buda – Variant 1
e6: The organist gets off the organ bench at Notre Dame de Buda – Variant 2

NDB_SFX – Cathedral Bells

You may find some street noise in these samples as they were all made outside the cathedrals. Try adding some reverb to them and playing back in lower volumes to imitate that the listener is inside the cathedral.

a3: Notre Dame de Kispest Trinity Bells (unlooped)
b3: Notre Dame de Kispest Small Bells (looped)
c4: Notre Dame de Kispest All Bells (looped, release triggered)
d4: Notre Dame de Buda Great Bells (looped)
e4: Notre Dame de Buda Small Bells (looped)

NDB_SFX – Valves

This program was recorded on the Positive manual without turning on a single stop. Therefore, only the valve sound is heard when you hit a note and release it. This program contains only a few number of wave files in order to allow you to stack it to any other organ stop you may wish to sound more closer.

NDB_SFX - Noises of the Inner Cathedral

To imitate a live recording, you may add the sounds of the inner cathedral in the background of your recording. Be sure to hold these notes as they are quite long.

c4: Thunder heard from inside the cathedral (0:36)
d4: Quiet thunder, footsteps in the background (0:16)
e4: footsteps in the church (0:23)
f4: footstep, money jingles (0:45)

f#4: footsteps at the choir (0:07)

g4: microphone setup – wood clicks (0:06)

a4: microphone setup – stand (metal) clicks (0:02)

b4: microphone setup – cable end knocks on the wooden floor (0:05)

c5: microphone assembly (0:30)

d5: car passes by, microphone assembly (0:17)

e5: microphone setup, quiet thunder roaring, a bit of wheezing, quiet bell in the background (0:13)

f5: various sounds of the inner cathedral, a sparrow tweets in the background up behind the choir (0:14)

Registration tips

If you are an experienced organist, you can safely skip this chapter; however, it may be worth having a glance on it.

First of all, it is important to mention that the stops of the two organs can be used simultaneously. The churches where we took the samples are always very busy, so we recorded those stops and combinations that sound somehow 'better'. There were some combinations, for example, *Fonds 16' 8' 4',* which we recorded on both instruments, because their character and style applies to different styles of music, and both of them sound really good. Here, we would like to give you a few recommendations on how to use these stops and combinations together, and how to create stops, which are not included in this library. Also, you will find a list of commonly used combinations of the samples. POS (Positive), GRO (Grand-Orgue), REC (Récit), BRW (Brustwerk) and PED (Pedal) represent the location of the combination, where it is commonly used.

Pre-baroque and baroque

The organ of Notre Dame de Kispest is rather a French-romantic sounding organ than a historical Silbermann; however, the many *Fonds + Mixtures* combinations sound great on this organ for J. S. Bach's grand toccatas. Actually, there are many baroque concerts in Notre Dame de Kispest during the year. Be very careful to adjust the proper volume settings for the mixture stops as they are very sensitive. You can use the *Cornet* together with the other organ as well: the organ of Notre Dame de Buda, which features lots of combinations that can be used for baroque music. For a Positive voice in toccatas *Mixtures, Mixtures + Trompette 8', Fonds 8' 4', Fonds 16' 8' 4'* and in particular *Scharff* should rather be used. *Tutti + Chamade* may be a bit too loud for such pieces, but not in for example *Passacaglia and Fugue in c* by J. S. Bach. You can stack any number of stops in GigaStudio to create a dynamic crescendo in your music. Start with the Fonds and then gradually add mixtures, then add *Trompete Harmonique 8'* and the other 8' stops of the *Récit*, then add the 4's and 16's. Be sure to use couples

as well when appropriate. You may also wish to use pre-recorded combinations, such as *Anches 16' 8' 4'* in fugues, J. S. Bach liked them very much. Also, add *Cornet* to the *Anches* to enforce the sound. For the pedals, all organs give you the foundational stops and combination that can be used for even a full minute sustained note. As for Notre Dame de Buda, feel free to experiment with all of the pedal combinations. *Fonds + Quint* and *Fonds + Quint Ped.* can also be used in such pieces. Here are a few commonly used combinations in this type of music:

Trios, triosonates, recitativos	
POS	Bourdon 8' Fonds 8'
GRO	Sesquialtera (+ Tremolo), Cornet
PED	Fonds 16' 8' or Fonds 16', Subbass 16'
Preludes	
GRO	Fonds + Quint
PED	Fonds + Quint Ped.
Toccatas (softer)	
POS	Scharff
GRO	Mixtures
PED	Fonds 16' 8', Plenum Bassoon 16'
Toccatas (louder)	
POS	Mixtures
GRO	Mixture + Trompette 8'
PED	Plenum Posaune 16'
Fugues	
POS	Mixtures or Scharff
GRO	Mixtures, Mixtures + Trompette 8', Anches 16' 8' 4'
PED	Plenum Bassoon 16' or Plenum Posaune 16'

Check out below on how to create additional combinations.

Romantic

We encourage you using several stops together, like *Anches 16' 8' 4'* with *Fonds 16' 8' 4', Trompete 8'* and *Fonds 16' 8' 4', Krummhorn with Octave 1', etc.,* NDB Pipe Organ Samples fits naturally this style of music as the sampled organs are special symphonic instruments.

It is not easy to define clear-cut categories here, like Toccatas or Preludes in the Baroque section, so we will give generic definitions instead, without trying to include them all (which would be nearly impossible).

The organ of Notre Dame de Kispest is a particularly romantic-sounding organ, so we highly recommend using it for those pieces, especially when you play pieces of C. Franck, Ch. M. Widor, or L. Vierne. For pieces of M. Reger, stops of Notre Dame de Buda might be more applicable. You can achieve a wider range of crescendos in the organ of Notre Dame de Buda, as it is a much bigger one, and therefore NDB feature more stops of it.

	Foundational stops (Fonds)
POS	Fonds 8’
GRO	Fonds 16’ 8’ 4’
REC	Fonds 8’
PED	Fonds 16’ 8’, Fonds 32’
	Récit solos
POS	Fonds 8’
GRO	Fonds 16’ 8’
REC	Trompete 8’, Hautbois 8’, Clarinet 8’
PED	Fonds 16’ 8’ (Fonds 32’)
	Moderated (louder) combinations
POS	Fonds 16’ 8’ 4’
GRO	Fonds 16’ 8’ 4’ together with Anches 16’ 8’ 4’
REC	Fonds 8’ together with Anches 16’ 8’ 4’
PED	Fonds 16’ 8’
	General Tuttis
GRO	Tutti + Chamade 8’
REC	Anches 16’ 8’ 4’ together with Mixtures + Trompette
BRW	Brustwerk Tutti
	Meditative (very quiet) combinations
POS	Flûte Harmonique (with tremolo) or the Gemshorn-type combinations, Gedackt 8’
REC	Voix Céleste (with sweller) or Flûte traversière + Bourdon á cheminée
PED	Fonds 32’, Fonds 16’

Modern music and improvisations

This is the most difficult type of music to give recommendations of. Please feel free to experiment with all stops of the library. Combining the organs will allow you to be more creative, especially when playing O. Messiaen’s, P. Cochereau’s or J.

Guillou's pieces, to mention a few. The *Anches 16' 8' 4'* combination of Notre Dame de Kispest is very impressive for improvisations. Also, try the *Krummhorn + Octave 1'* with a soft accompaniment on the Positive and a 32' Pedal for improvising meditative pieces. Speaking in specific pieces, the *Bombarde 16' Pedal* from Notre Dame de Kispest is particularly good for playing Messiaen's *Les Corps Glorieux: Combat de le Mort et de la Vie*. If you play such pieces or you are performing an improvisation, you may use the Crescendo combinations as well.

Creating new stops and combinations

On a sampling DVD collection, it is very hard to include every important stop of a symphonic organ, as all stops can be considered as important and there are more than a hundred at Notre Dame de Buda, for example. Not only the time of the recording and post processing would be extremely long, but the amount of data would also be unmanageable. In this edition of *NDB Pipe Organ Samples,* every important stop and combination is included so that you can stack different stops together while not having to utilize all resources of your computer with the pre-recorded combinations. You can play for example more than a hundred ranks just with two combinations.

First of all, the most common way to create new combinations is to **couple** some existing ones. These can be for example:

Fonds 16' 8' 4' or Fonds 8' 4'	with	Anches 16' 8' 4' (opened, closed or swelled)
Mixtures	with	Anches 16' 8' 4' (opened, closed or swelled)
Fonds 8' 4'	with	Trompete 8'
Fonds 8' 4'	with	Hautbois 8' (opened, closed or swelled)
Trompete 8'	with	Hautbois 8' (opened, closed or swelled)
Krummhorn 8'	with	Octave 1'
Trompete Harmonique 8'	with	Hautbois 8'
Anches 16' 8' 4'	with	Cornet

and so on. You may also use the coupling technique together with transposition. If you are trying to imitate the sound of a smaller organ, we prefer trying to combine the stops instead of using the combinations. Of course, this will not sound as good as an original combination.

Important notes and remarks

Files installed in the root directory of NDB^{v3}

There are a few files that are installed in the root directory of NDB that makes the library more convenient and easy to use.

NDB Cathedral 2 Reverb (Stereo) - FX Instance Instrument.gsi
NDB Cathedral Reverb (7-channel) - FX Instance Instrument.gsi
NDB Cathedral Reverb (factory Stereo) - FX Instance Instrument.gsi
NDB Swellbox - FX Instance Instrument.gsi

These files load the GigaPulse effects, which you probably wish to use if you do not run NDB on GigaStudio 3 Orchestra, or you do not want to load them as an insert effects in the DSP Station of GigaStudio. They are also handy when you load them as members of stacked instruments as they add the effect to all the instruments in the stack.

Tip: For flexibility, it might be better to use insert effects rather than these files.

NDB Cathedral 2 Reverb (Stereo) to AUX 1.gsp
NDB Cathedral 2 Reverb (Stereo)to AUX 2.gsp
NDB Cathedral 2 Reverb (Stereo) to AUX 3.gsp
NDB Cathedral 2 Reverb (Stereo) to AUX 4.gsp
NDB Cathedral Reverb (7-channel) to AUX 1.gsp
NDB Cathedral Reverb (7-channel) to AUX 2.gsp
NDB Cathedral Reverb (7-channel) to AUX 3.gsp
NDB Cathedral Reverb (7-channel) to AUX 4.gsp
NDB Cathedral Reverb (factory Stereo) to AUX 1.gsp
NDB Cathedral Reverb (factory Stereo) to AUX 2.gsp
NDB Cathedral Reverb (factory Stereo) to AUX 3.gsp
NDB Cathedral Reverb (factory Stereo) to AUX 4.gsp
NDB Swellbox to AUX 1.gsp
NDB Swellbox to AUX 2.gsp
NDB Swellbox to AUX 3.gsp
NDB Swellbox to AUX 4.gsp

These files load GigaPulse presets to the AUX return channels and set all knobs of the DSP Station to the appropriate settings. If you wish a drier sound in the case of the reverbs, increase the volume slider of each DSP Station channels or set the Wet/Dry Mix to a lower value. These files work correctly only in GigaStudio 3 Orchestra. Other editions of GigaStudio 3 may load these files and set the slider and

knob values, but as there is no GigaPulse Pro insert effect in these editions, the reverb will not be set. (Use FX Instance Instruments instead.)

Tip: You might want to start making a performance by loading these files first, as loading them after you made changes to the DSP station will reset those settings and even removes other insert effects.

Notes on GigaPulse[v3]

1. If you have not installed the factory impulse content with GigaStudio 3 for GigaPulse, then you may want to copy manually the contents of the "*\factory reverb*" directory on Disk 1 to the "*\Data\GigaPulse Content*" subdirectory of your *NDB Pipe Organ Samples* directory or to the Tascam GigaPulse content subdirectory (usually "*D:\Tascam\GPulse\Common\bin*"), and let GigaPulse rescan these directories. Note that if you are using only FX Instance Instruments, it is not required to do this.
2. If you do have the factory impulse content installed but you have preset 0028 missing, then copy the contents of the "*\factory reverb*" directory on Disk 1 to the "*D:\Tascam\GPulse\Common\bin*" directory (or wherever you have installed the GS3 content). Note that if you are using only FX Instance Instruments, it is not required to do this.

Notes on the convolution swellbox (SWL) function[v3]

1. To control the swellbox with the Foot Controller smoothly, the MIDI automation of the Wet/Dry slider is set to Port 1 Channel 1. If you use the foot controller in other configuration, you might need to reprogram the automation. You can do this by right clicking on the slider under the Wet/Dry Mix label and by generating a MIDI message which GigaStudio automatically identifies and sets.
2. If you load an instrument with an (SWL) function to a stacked instrument, make sure you do not to load another one, as then there will be two swellbox effects on the same stack, as if we had two embedded swellboxes. To avoid this, load *'SW: Opened'* instruments if you already have an SWL in the stack.
3. The SWL function, once loaded to a stack and routed to a Mixer Input (e.g.: 'Mx: 2:3'), will be effective on all other instruments on the same Mixer Input. Therefore, if you wish to use a convolution swellbox effect on more than one stops, regardless where they are loaded, you can setup the swellbox effect by either loading a stop with SWL function and route the other stops

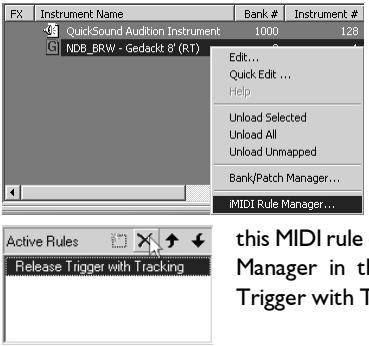
to that Mixer Input, or you can load *SW:Opened* stops and setup the swellbox insert effect in an AUX return channel. You can do this easily in GigaStudio 3 Orchestra by loading the appropriate .gsp file (e.g.: *'NDB Swellbox to AUX 4.gsp'*).

Notes on the Crescendos

Due to reasons of the .gig file format, you cannot set the volume or turn off the release triggered reverb in Crescendos. You can use however the Crescendos without the (RT) function, which do not contain release triggered reverbs at all.

About the iMIDI rules[v3]

In GigaStudio 3, every preset featuring the (RT) function was programmed with iMIDI *'Release Trigger with Tracking'*. The rule monitors the loudness of the sound that is played and adjusts the volume of the release trigger according to that. With the help of this rule, staccato notes are more realistic, because the short sounds do not produce the amount of reverb a sustained note does. If you wish to turn this MIDI rule off on a loaded instrument, select iMIDI Rule Manager in the Loader Pane and remove the 'Release Trigger with Tracking' and then select OK.



Troubleshooting – Before you contact us

Q: The installer did not work correctly and an error message window popped up..

A: You might have a faulty medium. Try cleaning the disk and press Retry. If it still does not work, check the disk in another DVD-ROM drive or try copying the contents of all disks to your hard disk and run setup from there. Should the disk be faulty indeed, please contact us at *support@ndb.hu* and we will replace it.

Make sure you do not have applications running in the background and you have enough memory to run the installer wizard. Also, make sure you have the right user privileges (Administrator) in your Windows XP system. If all this above did not solve the problem, please send us as detailed information about the error message as possible to *support@ndb.hu*.

Q: My computer cannot read the DVD disk/no contents can be seen on the disk.

A: Please check if your DVD reader supports reading DVD+R and DVD-R disks. Before sending the DVD back to us for a replacement, please check whether the disk is corrupted indeed (try it in a different machine). Please do not send a correct disk back. If you find the disk damaged or corrupted, please contact us by e-mail for further instructions.

Q: My computer does not produce any sound in GigaStudio when the NDB samples are loaded.

A: This problem may be due to misconfiguration or other conflict, please refer to your GigaStudio manual.

Q: The sweller/crescendo/tremolo is not working.

A: Please check if you switched to the proper instrument, and you are controlling the proper MIDI controller. Instruments with sweller have (SW or SWL) in their name, which means they are adjustable. If you find (SW: Opened) or (SW: Closed), the sweller position is fixed. We recommend using these fixed position instruments, in case you wish to save polyphony.

Support

For additional support, troubleshooting, with your technical problems or general questions please visit the NDB support page, post a message in the NDB Forum or contact us directly.

NDB Support:	*http://support.ndb.hu/*
NDB Support (email):	*support@ndb.hu*
NDB Forum:	*http://forum.ndb.hu/*

Register NDB Pipe Organ Samples

Please register your personalized copy of NDB Pipe Organ Samples at *http://support.ndb.hu/* to receive notifications of updates, new products and discounts on them. Shirokuma Ltd. will keep all collected information about its customers and visitors confidential. It will **never sell** or **share** information about individuals with any third party or any organization for any purpose.

Tip: Owners of the 24-bit edition of NDB can register directly by clicking on the *Start > Programs > NDB Pipe Organ Samples > NDB Product Registration* link.

‘Notre Dame de Buda’, Matthias-Church, Budapest

At the very heart of Buda's Castle District is the *Mátyás-templom*. Officially named as the Church of Our Lady, it has been popularly named after King Matthias Corvinus (Good King Mátyás) who ordered the construction of its original southern tower. In many respects, the 700 year history of the church serves as a symbol (or perhaps a reminder for Hungarians) of the city's rich, yet often tragic history. Not only was the church the scene of several coronations, including that of Charles IV in 1916 (the last Habsburg king), it was also the site for King Mátyás' two weddings (the first to Catherine of Podiebrad and, after her death, to Beatrice of Aragon).

The darkest period in the church's history was the century and a half of Turkish occupation. Although following Turkish expulsion in 1686 an attempt was made to restore the church in the Baroque style, historical evidence shows that the work was largely unsatisfactory. It was not until the great architectural boom towards the end of the 19th century that the building regained much of its former splendor. The architect responsible for this work was Frigyes Schulek.

Not only was the church restored to its original 13th century plan but a number of early original Gothic elements were uncovered. By also adding new motifs of his own (such as the diamond pattern roof tiles and gargoyles laden spire) Schulek ensured that the work, when finished, would be highly controversial. Today however, Schulek's restoration provides visitors with one of the most prominent and characteristic features of Budapest's cityscape.

About the organ

While King Matthias had organ builders in his court and thus the church was likely to have an organ already that time, the first organ we have records of was built in 1688: Esztergom archbishop György Széchényi donated a positive organ worth 100 forints. A mere seven years later palatine Pál Esterházy had the choir of the church extended and probably a bigger organ built.

The organ was destroyed by a fire in 1723. A new one was soon made by an organ builder named Márton and an even larger one was started in 1768 but then later it was sold.

After the long restoration of the church a new organ was built again, the case of which was also designed by Frigyes Schulek. Unfortunately, it soon turned out that the instrument did not meet the requirements.

In 1909, using the donation of Franz Joseph the church received a new organ built by the Rieger manufacture in Jägerndorf. The instrument was built in a late romantic style, using the plans of Viktor Sugár and had four manuals and 77 stops. According to the fashion of the time, the pipes of manual 4 were put in the attic of the church and their sound was directed to the church aisle via a 14-meter-long wooden tube.

In 1931, again using the plans of Sugár, the Budapest manufacture of the Rieger company extended the instrument to 85 stops. The pipes were brought down from the attic and the inner construction of the organ was changed – unfortunately, to the worse.

During the 1944 Soviet siege the instrument was damaged badly. It was temporarily restored after the war but the condition of the organ turned worse and worse.

In 1979 a committee was created to design the new instrument with the cooperation of Ferenc Gergely, István Koloss, István Baróti and titulaire du grand-orgue of the church, Bertalan Hock. They designed a symphonic organ that uses the valuable pipes and the action of the old instrument that could be saved and combines romantic and baroque style marks.

It was again the Rieger-Kloss organ factory that performed the restoration. Their excellent work resulted in a new, five-manual, 85-stop organ with electropneumatic action (Rieger Op. 3541). The organ was consecrated by Cardinal László Lékai on January 25, 1984.

After finishing the grand organ, a two-manual, 18-stop Fernwerk was built. This instrument can also be sounded from the console of the grand organ but it can also be used independently during liturgy or as an accompaniment of the concerts in the church.

The organ was extended again in 1999 and the number of Setzer combinations was increased from 8 to 798 using a whole computer. Another stop, Chamade 8' was built into the organ. Today it has 104 stops altogether.

Factsheet of the organ

Opus No.	3541
Built in	1983
Number of manuals	5 + pedal
Number of stops	104 (99 basic voices)
Action	electric key action electric stop action
Windchests	slider and cone
Console	electric, electric setter
Number of pipes	6 785
Tuning	Equal temperament

List of stops

I. Positiv A
(C-a3/a4, 70 tones)

Principal 8'
Boudon 8'
Salicional 8'
Octave 4'
Gedackt 4'
Nasat 2 2/3'
Waldflöte 2'
Terz 1 3/5'
Scharff 5x5 1/3'
Trompete 8'
Sp. Trompete 8'
Tremulant

II. Hauptwerk A
(C-a3, 58 tones)

Principal 16'
Praestant 8'
Gemshorn 8'
Nachthorn 8'
Octave 4'
Rohrflöte 4'
Quinte 2 2/3'
Superoctave 2'
Cornett 3-5x 8'
Mixtur 5x1 1/3'
Trompete 8'
Trompete 4'

III. Récit
(C-a3/a4, 70 tones)

Bourdon 16'
Principal 8'
Bourdon a cheminée 8'
Flûte traversière 8'
Gambe 8'
Voix céleste 8'
Octave 4'
Flûte octaviante 4'
Dulciane 4'
Quinte 2 2/3'
Octavin 2'
Flûte conique 1'
Cornet 3-4x2 2/3'
Mixtur 5x 2'
Cymbale 3x1/5'
Basson 16'
Trompette harmonique 8'
Hauptbois 8'
Voix humanie 8'
Clairon 4'
Tremulant

IV. Positiv B – Brustwerk
(C-a3, 58 tones)

Gedackt 8'
Quintatön 8'
Spitzflöte 4'
Principal 2'
Larigot 1 1/3'
Octave 1'
Obertön 3x1 1/7'
Zimbel 3x 2/3'
Sordun 16'
Krummhorn 8'
Glocken
Tremulant

V. Hauptwerk B – Bombarde
(C-a3/a4, 70 t.)

Bourdon 16'
Flûte harmonique 8'
Quinte 5 1/3'
Praestant 4'
Tierce 3 1/5'
Septième 2 2/7'
Flûte 2'
Mixtur 6x2 2/3'
Bombarde 16'
Tuba 8'

Pedal
(C-f1, 30 t.)

Bourdon 32'
Principal 16'
Praestant 16'
Violon 16'
Subbass 16'
Bourdon 16'
Quinte 10 2/3'
Octave 8'
Flûte 4'
Bourdon 8'
Tierce 6 2/5'
Octave 4'
Flûte 4'
Nachthorn 2'
Locatio 5x5 1/3'
Mixtur 4x2 2/3'
Bombarde 32'
Posaune 16'
Basson 16'
Trompete 8'
Clairon 4'
Glocken

Couples

I., Positiv A	I+III, I+IV, I+V, I Super, I+III Super
II., Hauptwerk A	II+I, II+III, II+IV, II+V, II+I Super, II+III Sub, II+III Super, II+V Super
III., Récit	III+IV, III+V, III Sub, III Super
IV., Positiv B - Brustwerk	Fernwerk I.
V., Hauptwerk B - Bombarde	Fernwerk II.
Pedal	P+I, P+II, P+III, P+IV, P+V, P+V Super

Fernwerk (Choir organ) stop-list

Fernwerk I. man.	**Fernwerk II. man.**	**Fernwerk Pedal**
Principal 8’	Gedackt 8’	Subbass 16’
Flûte 8’	Blockflöte 4’	Principal 8’
Octave 4’	Dolce 4’	Gedackt 8’
Quinte 2 2/3'	Principal 2'	Octave 4’
Flûte 2'	Quinte 1 1/3'	Fagott 16’
Terz 1 3/5'	Krummhorn 8’	
Mixtur 3x1 1/3'		

‘Notre Dame de Kispest’, Budapest

The first people settled in Kispest (currently the 19th district of Budapest) in the second half of the 19th century. Their first church was nothing more but a small chapel with a belfry and a wooden cross. The votive church was built later, in memory of crown prince Rudolf Habsburg who died in 1889. The foundation stone was laid on June 7, 1903 and following a fast construction, the church was consecrated on October 23, 1904.

The brick-covered, 50-meter long and 20-meter wide parish church of neogothic style was designed by Antal Hofhauser. The tower of the church is a very impressive sight and the church is still a very characteristic mark of the district.

Inside you can find a neogothic, aisleless church, which is 32 meters long (without the altar) and 14 meters wide. The benches of various styles can seat 250-300 people.

The organ was originally made in 1927, by Otto Rieger. It was reconstructed between 1995 and 2002, according to the plans and direction of Bertalan Hock, by László Varga.

The church was renovated between 1998 and 2002 so now, a hundred years later it can again be seen in its full splendor.

Factsheet of the organ

Opus No.	2256*
Built in	1928 (reconstructed in 2002)
Number of manuals	2 + Pedal
Number of stops	38
Action	electric key action electric stop action
Windchests	slider and purse
Console	electric, electric Setter
Number of pipes	~2500
Tuning	Equal temperament

* Rieger Opus 2256. Fully reconstructed by Varga Organ Manufacture in 2002.

List of stops

I. Grand Orgue
(C–a3)

Principal 16'
Praestant 8'
Flûte harmonique 8'
Bourdon 8'
Salicional 8'
Unda maris 8'
Octave 4'
Flûte 4'
Quinte 2 2/3'
Doublette 2'
Cornet 5x 8'
Mixtur 5-7x 8'
Trompette 8'
Clarinette 8'

II. Récit Expressif
(C–a3)

Bourdon 16'
Diapason 8'
Flûte 8'
Bourdon 8'
Gambe 8'
Voix céleste 8'
Dulcian 4'
Flûte octaviante 4'
Nasard 2 2/3'
Octavin 2'
Tierce 1 3/5'
Mixtur 3-5x 1 1/3'
Trompette harmonique 8'
Basson-hautbois 8'
Voix humaine 8'
Clairon 4'
Tremulant

Pédale
(C–f1)

Principal 16'
Violon 16'
Soubasse 16'
Octave 8'
Bourdon 8'
Octave 4'
Bombarde 16'
Trompette 8'

Couples

I. Grand Orgue	I+II, I+II sub, I+II super
II. Récit Expressif	Sub II, Super II
Pédale	P+I, P+II, P+II super

About the pipe organ

A pipe organ is a keyboard instrument that produces sound by letting wind travel through pipes or reeds. Pipe organs are most commonly encountered in churches and are not simply large, majestic musical instruments but also a beautiful piece of art. The pipe organ repertoire is particularly rich in solo music but the organ is also frequently used to accompany choral and congregational singing.

History of the pipe organ

As its name shows, the pipe organ consists of pipes, so technically, pipes made of animals and plants could be considered its earliest predecessor. Nevertheless, it is usually the bagpipe that is considered as its ancestor. Its history goes back to at least the ancient times. Findings of the period prove that the pipe organ and its various ancestors did exist (e.g. the water organ [hidraulis] uncovered in 1931, Aquincum). Many old instruments still work today.

We have already written records – pictures and descriptions in codices – about medieval pipe organs. A very characteristic organ type of the period was the portable organ, which had only a few ranks of pipes and was used only on occasion. Later, as the instrument grew, fixed solutions became popular (positive organ). The organ type that had only reed pipes (regal) also appeared first in the medieval ages. Its wind chest was made of bronze and was blown with pairs of bellows. Several people were needed to make the instrument sound (in the 13th century, 70 people had to work on blowing the 400-pipe organ of a cathedral). Until the medieval organs it was not possible to switch on the various pipe ranks separately (blockwerk). Sliders – which allowed this – appeared only in the 16th century. Organs of this time featured pipes of the same width (they were measured to the width of an egg). Later, as the size of the organ grew, several wind chests were built into the instruments. Each wind chest had its own manual, or playing keys. Later so-called 'werks' ('works', which featured certain stops to create specific sounds) were built on these chests.

By around the 16th century all the basic pipes were formed, those that can be found in almost all contemporary organs. Wind pressure measurement (a glass tube) was first used in the 17th century, which allowed designing pipe organs more consciously and more precisely. This was the time when stops imitating strings appeared and at the beginning of the 18th century, in Spain, the swellbox, which allowed controlling (via a pedal) the dynamics of the sound of the pipes locked in the wooden box. By this time the organs covered the classical range of voice and transmission stops were introduced, which used the pipes of other stops, without coupling. Organs built in Italy had no pedals, had only a few third-sounding mixture stops, had no reeds but features the so-called Italian principal stop (Diapason), which is an essential one ever since in modern instruments. Austrian and South German

organ also had few reeds, while the Spanish instruments featured a lot of flutes, cornets, furthermore quint- and third-sounding mixture stops. Using combinations, (stopped 8' + wide Principal 4' + 2 2/3' and 1 3/5') they could create a trumpet-like sound. Spanish instruments have a lot of reeds up to day. The stop of horizontal trumpets built into the facade of the organ, the so-called 'Spanish trumpet', or Chamade is also a Spanish invention.

Organ building of the baroque and romantic era is very diverse. Instruments of many important organ builders have survived; some of them found their places in museums but most of them are still in the churches, being used (e.g. the Silbermann organs or the instruments of Cavaille-Coll). Some instruments were restored or rebuilt (e.g. St. Eustache, Paris), others are still in their original form (e.g. St. Ouen, Rouen).

The development of electronics and digital technologies made it possible to control and program the mechanic parts. Pneumatic actions were enhanced by electric aids: relays were used to open the valves (electropneumatic action). MIDI control is quite frequent in today's modern consoles.

Parts, mechanism, and sound production

Conventional pipe organs consist of four main parts: the console, consisting of keyboards and other controlling devices; the pipes that produce the sound; the mechanism, or action; and a device that generates wind. The pipes and the action are protected by a free-standing structure, the organ case. Traditionally, rows of dummy or real pipes and carved woodwork in attractive arrangements partially screen the openings in the case. As some of the organ pipes can be more than 20 feet long, organ cases can be very large and usually play an important artistic role.

To fully enjoy the beauty of organ sound, the instrument must be placed very carefully – most organ music requires a resonant space with three seconds or more of reverberation time. Pipes in an acoustically 'dead' environment sound pale, while fully exposed pipes without encasement usually produce a raw, unfocused sound, which you may usually hear in concert halls.

The pipes of the organ stand in a row on an airtight chest that is supplied with wind from bellows or a rotary blower. Under each pipe is a valve, or pallet, connected by a system of cranks and levers to its respective key. Normally a wind reservoir, loaded by weights or springs to maintain sufficient wind pressure, is interposed between the wind generator and the wind-chest. This reservoir has a safety valve that operates to relieve excessive pressure when the reservoir becomes full.

The pitch of the notes is determined by the length of their pipes. Among pipes of similar type, the one half the length of the other sounds exactly an octave higher. Since the loudness of a pipe sounding on a constant pressure of wind cannot be controlled, the expressive potential of an organ in improved by using several ranks

(pipe sets, also called registers or stops). A harmonium has very few of them, a small organ may have 2-15, a middle-sized organ has 15-30 and large church and auditorium organs may have as many as a 100 or more ranks. (However, the majesty of the sound of the organ is not determined by its number of ranks, world's most beautiful sounding instruments usually don't have hundreds of ranks.) The pallet controlled from each key admits wind to all the pipes belonging to that key; but, in order to allow the organist to use any of the ranks of pipes, alone or in combination, an intermediate mechanism is provided by which he may stop off any rank or ranks. That is why the term *stop* is also used in the sense of 'rank of pipes'.

Stop and key mechanisms

The operative part of the stop mechanism lies between the pallet and the foot holes of the pipes. It normally consists of a strip of wood or plastic running the full length of each rank of pipes. In it is drilled a series of holes, one of which meets exactly the foot hole of each pipe. The perforated strip, or slider, is placed in a close-fitting guide in which it may be moved longitudinally. When it is moved a short distance, so that its holes no longer match the pipes, wind is cut off to that rank, even when the organist opens the pallets by means of the keys. Wind-chests in which the stops operate in this way are called slider chests and they were in almost universal use before the 20th century. The slider is connected to the console by a system of levers and cranks, and it terminates in a knob that the organist pulls outward to bring the stop into play or pushes in to silence it. Certain combinations of stops on each manual are more commonly needed than others so usually there are 'shortcut' knobs or pedals on the console (called pistons). When these combination (or composition) pedals are pushed, stops connected to it are drawn on, and any others that are already drawn are pushed off.

In order to play two or more interweaving, contrasted melodic lines, with two different voices (soft and loud, harsh and quiet together or in rapid succession) multiple manuals are needed. Each manual department is self-contained and each controls its separate wind-chest and stops. Thus the organist may vary the sounds produced either by changing the stops on the manuals being played or by prearranging the stops and changing from one manual to another. Since the 18th century organists have had yet a third way, called swell boxes, of controlling the volume of sound. The pipes of one or more manuals may be enclosed in a box, one side of which has shutters that are connected to a pedal (sweller pedal) at the console. By opening and closing the shutters, the sound is made louder or softer. Further expressivity is realized by an accessory called a tremulant, which by repeatedly interrupting the flow of wind to the wind-chest creates a pulsation in the tone of the pipes.

Since the 14th century, one of the manuals – controlling longer pipes – is usually played by feet. Organs in the past in Italy and Spain had several different pedal keyboards with fewer keys than the modern organs, which have pedal keyboards of

30 or 32 notes. The organist may wish to combine the stops of two different manuals or to couple one or more of the manuals to the pedals. This is realized by a mechanism called a coupler.

In the simplest mechanical action, the connection from key to pallet is by a series of cranks, rollers, and levers that transmit motion horizontally and vertically from keyboard to wind-chest. The overall distance may be considerable, and the main distance is bridged by trackers, slender strips of wood, metal, or plastic, which are kept in constant tension. Adjustment screws are employed to take up slack occasioned by wear and changes of humidity.

Most of the organs built before the late 19th century have such tracker action and they are becoming popular again, especially in modern organs built according to historical principles. Many organists actually prefer tracker action to all other forms because of its superior sensitivity of touch – even though in very large organs with tracker action, considerable strength may be necessary to depress the keys.

Organs may also have other (pneumatic, direct electric, or electropneumatic) forms of action but these actions normally result in a loss of sensitivity and responsiveness. A compromise has been used successfully with tracker action for each department, with the coupler action operated electrically. This arrangement has considerable benefits, since the coupling together of three or four manuals with tracker action results in a very heavy touch. Electric stop action may also be combined with tracker key action, enabling the use of electric (including solid-state) combinations – an invaluable aid in quickly changing groups of stops, especially in larger instruments. Some organs may have more than one console to play on – usually with different action.

Flue pipes

There are two main categories of organ pipes: flue pipes and reed pipes. Flue pipes (wood or metal) account for the majority of the stops of an average organ. The pipe consists of three main parts: the foot, the mouth, and the speaking length. The pipe stands vertically on the wind-chest, and wind enters at the foot hole. The foot is divided from the speaking length by the languid, a flat plate; the only airway connection between the foot and the speaking length is a narrow slit called the flue. The wind emerges through the flue and strikes the upper lip, producing an audible frequency, the pitch of which is determined by and amplified in resonance by the speaking length of the pipe.

The tone of a pipe is determined by many factors, including the pressure of the wind supply, the material of the pipe, the size of the foot hole, the width of the flue, the height and width of the mouth, and the scale, or the diameter of the pipe relative to its speaking length. The material of which the pipe is made also exerts an influence; it may be an alloy of lead and tin, wood, or, more rarely, pure tin or copper, and for the bass pipes zinc. The pipes may also vary in shape, a common variant being an upward taper in which the pipe is smaller in diameter at the top than at the mouth.

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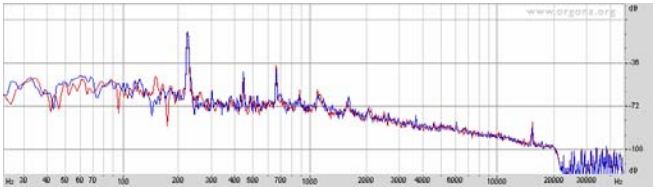
Or, the top of the pipe may be completely closed by a stopper. Such a pipe is said to be stopped; a stopped pipe sounds an octave lower in pitch than an open pipe of the same speaking length.

Open pipes of large diameter are said to be of "large scale," and open pipes of small diameter are said to be of "small scale." Large-scale pipes produce a fluty or foundational quality of tone that is free from the higher harmonics. Small-scale pipes produce a bright quality of tone that is rich in harmonics, recalling bowed strings. Stopped pipes can be particularly foundational in tone, and they favor the odd-numbered at the expense of the even-numbered partials. Tapered pipes are somewhere between stopped and open pipes in tone quality.

Flue pipes are tuned by increasing or decreasing the speaking length. In the past, several methods of tuning were employed, but in modern times this is often done by fitting a cylindrical slide over the free end of the speaking length and sliding it up and down, lengthening or shortening the pipe as required. In stopped pipes the stopper is pushed farther down to sharpen the pitch or is pulled upward to lower it.

The attack of the note may also be greatly influenced by cutting a series of small nicks in the edge of the languid. Heavy nicking, commonly practiced in the early 20th century, produces a smooth and sluggish attack. Light nicking or no nicking, as used up to the 18th century and in some more advanced modern organs, produces a vigorous attack, or chiff, somewhat like tonguing in a woodwind instrument. If not excessive, this chiff enhances the vitality and clarity of an organ.

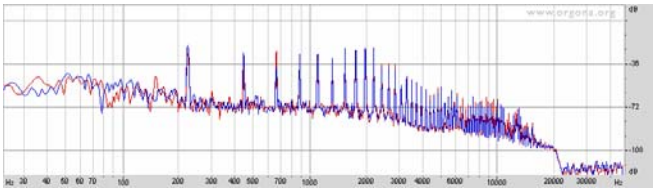


Spectral view of the sound of a flue pipe (Gedackt 8' – A3, +16 cent; 222.09 Hz)

Reed pipes

Organ reeds were probably originally copied from instrumental prototypes. A reed stop may have a beating reed like that of a clarinet or a free reed. The shallot of a beating reed pipe is roughly cylindrical in shape, with its lower end closed and the upper end open. A section of the wall of the cylinder is cut away and finished off to a flat surface. The slit, or shallot opening, thus formed is covered by a thin brass tongue that is fixed to the upper end of the shallot. The tongue is curved and normally only partially covers the shallot opening. But, when wind enters the boot, the pressure of the wind momentarily forces the tongue against the shallot, completely closing the opening. Immediately, the elasticity of the brass asserts itself, and the tongue reverts to its curved shape, thus uncovering the opening. This process is repeated rapidly.

The frequency of the pulsations of air that enter the shallot is determined by the effective length of the reed and, in turn, determines the pitch of the note. Thence, the pulsations pass out into the tube, or resonator, which further stabilizes the pitch and decides the quality of the note. Most reed resonators have a flared shape. As in flue pipes, a wide scale favors a fundamental tone, and a narrow scale favors a bright tone. Cylindrical resonators produce an effect similar to that of stopped flue pipes, the note being an octave lower than the equivalent flared pipe and the tone favoring the odd partials. Some reed pipes, such as the *Voix Humaine*, have very short resonators of quarter or eighth length. Pipes the resonators of which have no mathematical relationship to the pitch are known as regals; regal stops were popular in the 17th century, particularly with the North German school, and their use has been revived in modern times.



Spectral view of the sound of a reed pipe (Trompete Harmonique 8' – C4, +19 cent; 445.11 Hz)

Organ stops

The pitch of any pipe is proportional to its length. Most modern organs have a manual compass of five octaves, from the second C below middle C to the third C above; an open pipe sounding the low C is about 8 feet (2,5 meters) in speaking length (64 vibrations per second). The shortest pipe in the same stop, is thus about 3 inches (8 centimeters) long (2 048 vibrations per second). While large- and small-scale ranks often imitate the tones of flutes and bowed strings respectively, and are named accordingly, the most characteristic tone of the organ is produced by its *Principal* stops. These are of medium scale and moderate harmonic development – neither too dull nor bright. Therefore, from the earliest times, stops were arranged in choruses, and the principal chorus is the very backbone of any organ.

A chorus consists of stops of roughly similar quality and power but at a variety of pitches. A unison principal is known as *Principal 8'* because of its longest (8-foot) pipe. The next stop at an octave pitch would have the largest pipe of 4 feet long. Next comes a 2-foot stop, while the suboctave pitch is represented by a 16-foot stop. The top pipe of a 2-foot stop has a speaking length of only three-quarters of an inch, and this is about the practical upper limit.

Because an organ with nothing higher in pitch than a 2-foot stop would be lacking in brilliance, organs have so-called mixture stops, which have several high-pitched pipes to each note. These mixture stops are so high that they cannot be carried right

up to the top note so they break back an octave at some convenient point, sometimes even more than once. The result is a balance of power between bass and treble and a harmonious power that is completely peculiar to the organ and can be produced in no other way.

Mixture stops also contain ranks sounding at pitches other than in octaves with the 8-foot principal. In chorus mixtures these normally sound at a fifth above the unison (e.g., G above C), although ranks sounding at a third above and even at a flat seventh can also be found. These quint- and third-sounding ranks reinforce the natural upper partials of the harmonic series (although they were included in organs long before this was understood).

Off-unison ranks are also available as separate stops, mostly sounding at an interval of a 12th (an octave and a fifth; 2 2/3'), 17th (two octaves and a third; 1 3/5'), or 19th (two octaves and a fifth; 1 1/3') above the unison. These are used melodically to color the unison and octave stops, and they may be wide or narrow in scale. Such stops are known as mutation stops, as opposed to the mixtures, or chorus stops. Their use is essential for the historically correct performance of organ music.

The recording and editing process

We have decided to record NDB Organ Samples in 2002 and started to work in February 2003. After a day of tests and measurements, the first recording process took three days at Matthias Church and two days at Notre Dame de Kispest. In 2004 we had a second chance to record more combinations and stops and spent two more nights at both churches.

For the recording we used a pair of Neumann U87 microphones and a high-precision sound card to capture the sound of the organ and the natural reverb of the cathedrals. The microphones were attached to a computer using a custom-built, low-noise microphone pre-amplifier. The sampling rate of the recording was 96 000 Hz, while the bit depth was 32 bits. The results were saved to .wav files (type 3, 32-bit 0.24 normalized float). Recording the noise of the organ engine was also important for the post processing. The noise reduction was a critical point of the editing, because we wanted to keep the high sound quality, while we had to remove the noise, as without removal, every new note in a chord would add another unit of noise to the sound. Therefore, every single note was de-noised with its own noise print at 96 kHz/32-bit in six-seven phases in average. This took well over a year to complete. After reducing the noise, the samples were downsampled to 48 kHz/24-bit (and 16-bit for the GigaStudio 2.x) and the .GIG program files were created and programmed. For the measurements, we used the same equipment with the same recording conditions, but in some cases where they were appropriate, we recorded the impulse responses directly in 48 kHz. These measurements at both churches were a great help in having information about the natural coloration of the

reverb of the organ sound and allowed us to create the presets for the convolution reverb engine.

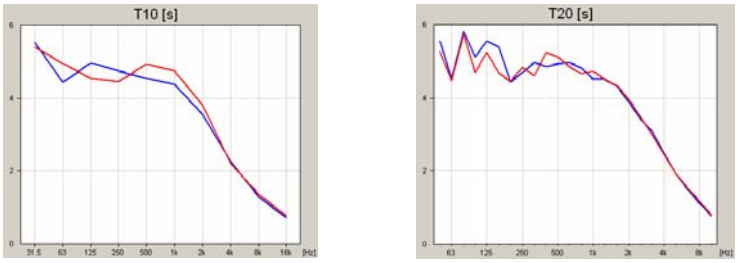
We took 25 to 40-second samples (full minute samples in case of pedal sounds) to keep the sound as natural as it can be and to avoid looping. Pedal sounds had to be longer because it is quite common to have a long, sustained note on the pedal. As we had a very limited time in the churches and our goal was to use this time optimally to record a large number of stops and combinations, there is a very small number of pedal sounds that we took only 30-second samples and created 1-minute samples later. The listener will not notice this, though, and most of the pedal sounds are true 1-minute samples.

About transposition

We took a sample of every second or minor third on the manual stops and chromatically or seconds on the pedal stops. In our case it was rarely necessary to record every single note. These symphonic organs are evenly tempered and thus it is possible to use the computer to interpolate the sounds really well, with a difference hard to identify. GigaStudio automatically does this. Our measurements proved that there is no significant, audible difference in the harmonics, and we did carry out a number of listening tests to find the reasonable limit, where adding more samples only decreases performance but does not really make an audible difference.

As there are no loops in the samples, there can be no modulation problems of that reason, either; using loops would not result in natural sounds, anyway. The intonation of the pipes does not differ enough within a second or even a third in these organs that it would degrade the authenticity of the sound; and no problems result from transposing the pipe wind, either, because the pipe wind, especially at the high frequencies, is very similar to a band-limited white noise (i.e., it has the same volume at all frequencies), which means it is indifferent to transposition.

Measurements proved that the contraction of the reverb in the release samples caused by transposition is no more than 16% compared to actual reverb that is heard in the cathedral.



ISO 3382 T10 and T20 diagrams for two channels

The church reverb is actually shorter for high pitches than for low ones. This means that for a well and evenly tempered large organ, transposing sounds to this extent does not result in any audible problems.

Some interesting facts about NDB

- The library includes 22 GB of sound sample data.
- Every recording was made actually at 96 kHz/32-bit.
- 3401 wave files were created and the backups filled 64 DVD disks.
- There are over 2,000 manhours of work in this collection.
- Over half of the revenue is donated to the churches for the restoration of the two organs.
- We are still having a slightly bad remorse for playing loud white noise and sine sweep sound when we were measuring the impulse responses in the cathedrals at midnight – for hours.
- A massive arsenal of pro-audio and IT equipment of over $100,000 value was used to create this library – and we dropped and broke a 19" monitor during the first recording night.
- For the impulse response measurements, we had to enter the organs, so we had the opportunity to make photographs and videos never seen before.
- We experienced a thunderstorm upon setting up the recording equipment inside the completely dark and empty cathedral which was flashing by lightning frequently – we were fast enough to record the sound: you'll find the results in the library.

Organ stops

The names of the stops on the organs vary greatly, by country, maker and period. While the following list is by no means complete, we are trying to give a little help on the names that appear on the registration board of the organs sampled.

Stop name	Description
Basson	Bassoon
Basson-hautbois	Bassoon-oboe
Bombarde	Bombarde – originally clear, colorful, later the strongest bass reed pipes.
Bourdon	Wide, deep, humming, in higher pitches singing, covered metal or wooden pipes.
Bourdon à cheminée	'Chimney' bourdon. 'á cheminée' (Rohr in German names) indicates the small extension piece at the end of a closed pipe.
Clairon	Clarion, a high-pitched trumpet sound
Clarinette	Clarinet – medium-pitched pipes that resemble the actual instrument.
Cornet, Cornett	Cornet
Cymbale, Cimbel	Highest-pitched, tight, multirow pipe set. Lots of repetitions, at various harmonics. The brightest-sounding crown of the organ sound.
Diapason	See Principal.
Doublette	2' principal stop on French organs.
Dulcian	Soft, cylinder-shaped or tapered flue pipes.
Flûte	Flute
Flûte conique	'Conic' flute.
Flûte harmonique	See Querflöte.
Flûte traversière	See Querflöte.
Gambe	Cylinder-shaped or tapered flue pipes with a colorful, stringlike sound.
Gedackt	'Covered' – indicates that the pipes are covered.
Gemshorn	Medium-wide conic, medium-volume or quiet, horn-like flue pipes.
Glocken	Glockenspiel-like sound (realized by multiple pipe sets, e.g. 2' + ¾')
Hauptbois	Oboe
Krummhorn	'Bent horn', reed pipes with natural-length cornets
Locatio (Hintersatz)	A deep, large mixture of many unison and fifth pipe sets. Recently sometimes includes thirds and sevenths.
Mixtur	Mixed set of narrow pipes of high octaves and quints. At least two sets of pipes, on larger organs can be as many as 10 sets. This is the stop that gives the characteristic organ sound.
Nachthorn	'Night horn', the widest pipes of the organ, may be open or covered. In spite of being wide, these pipes sound quite soft.

Nasard, Nasat	A harmonic stop of quint or its octaves, giving a 'nasal' sound.
Obertön	Harmonics (several rows of them)
Octave	Principal pipes sounding at the octave of the unison. The cleanest stop of the whole organ, the base of tuning.
Octavin	Wide, soft blow-through pipes in French organs.
Posaune	Strong 16' or 32' reed pipes played by the pedal.
Praestant	Principal pipes standing in the front of the organ, usually 4'.
Principal	'Main play', the major element of the organ sound. Typical metallic, organ-like sound.
Querflöte	'Transversal flute', wide blow-through pipes of twice the size as the normal open pipes. A clear, somewhat veiled flute sound.
Quintatön	'Quinter', narrow, closed base pipes sounding the fifths strongly. Quite nasal, somewhat bitter sound.
Quinte	A harmonic register of fifths (e.g. when a C is pressed, a G sounds).
Rohrflöte	Pipe flute – medium-wide closed pipes with an extension that yields a brighter sound than the fully closed flute.
Salicional	Willow pipe – a tight, cylindric, somewhat string-like register.
Scharff	Acute, 'sharp' – a mixed rank that is tighter and of higher pitch than Mixtur.
Septième	Seventh – when a C is pressed, A# sounds.
Sordun	Reed pipes with short cornets that give a humming sound.
Soubasse	Same as Subbass.
Sp. Trompete	Spanish trumpet – strong trumpets built horizontally in the front of the organ.
Spitzflöte	'Peak flute' – a tight, bright flute with a nasal sound.
Subbass	Lower bass.
Superoctave	A 2' or 1' principal register.
Terz, Tierce	Third – when a C is pressed, E sounds.
Trompete, Trompette	Strong reed pipes that resemble trumpet sound, usually with a cornet-shaped resonator.
Trompette harmonique	Double-sized, blow-through trumpet.
Unda maris	'Wave of the sea' – a soft, flute-like pipe rank tuned a little different from normal. Together with other stops it makes the sound 'float'.
Violon	Tight, string-like pedal stop.
Voix céleste	'Heavenly sound' – two sets of tight string pipes tuned a little different from each other. Gives a floating sound.
Voix humanie	'Human voice' – quiet reed pipes with a short cornet that resemble human voice.
Waldflöte	'Forest flute' – medium-wide, somewhat conic pipes.
Zimbel	See Cimbel.

Tuning information

We would like to provide you with a useful list of widely-used organ tunings in order to allow you to change your instrument's scale to the desired one.

Deviation from equal temperament in cents

	C+0	C#+0	D+0	Eb+0	E-0	F+0	F#+0	G+0	G#+0	A+0	Bb+0	B+0
Equal	0	0	0	0	0	0	0	0	0	0	0	0
1/4 Comma Modified Mean Tone	0	-3.5	-7	-10.5	-14	-16	-14	-12	-7	-1	5	2.5
1/8th Comma "Well Tempered"	0	-2	-4	-6	-4	-14	-12	-10	-8	-6	-4	-2
18th Century English (ord)	0	-3.5	-7	-16	-14	-14	-14	-14	-14	-8	-7	-3
Alexander Metcalf Fisher's Modified Mean Tone of 1818 In Simplified Form	0	-3.5	-7	-10.5	-14	-17.5	-21	-15	-20.5	9	4.5	2
Augustus De Morgan	0	1.5	-4	-6	-8	2.5	1.5	-5	-1	-5	-1.5	-1
Bach (Klais)	0	0	-3.75	-7.5	-12.5	-13	-11.5	-9.5	-7.5	-5.5	-3.75	-2
Bach's "Wohletemperiert" (Rediscovered By Kellner)	0	-3	-5.5	-8	-11	-9	-12	-10	-8	-6	-4	-2
Bendeler III	0	-4	-8	-6	-4	-8	-6	-2	-2	-6	-4	-2
Broadwood "Best" Tuning (1885)	0	-2	-4	-6	-8	-9	-7	-5	-4	-5	-3	-1
Charles Earl Stanhope Improved Kirnberger IIA	0	2	-3	-8.5	-14	-12	-11	-9	-7	-5	-4	-2
French 18th Century Temperament Ordinaire II	0	-2	-4	-10	-8	-10	-12	-14	-12	-8	-4	-2
Gioseffo Zarlino (2/7 Comma Mean Tone) (1558)	0	-4.1	-8.2	-12.7	-16.4	-20.5	-24.6	-28.4	-32.5	12.7	8.1	4.1
Idealised Well Temperament	0	-2.5	-5	-7.5	-10	-10	-9	-7	-5	-3	-1	0
Jean Phillippe Rameau's Modified Mean Tone	0	-3.5	-7	-10.5	-14	-17	-15.5	-13.5	-11.5	-4	5	3.5
Jean-Le Rond D'Alembert (1752)	0	-3.5	-7	-10.5	-14	-16.5	-19	-22	-23.5	-18	-10.5	-6
John Marsh (4/25 Comma Mean Tone) (1809)	0	27.8	29.5	53.3	-8	-6	-4.2	-22.5	-22.8	-1	23	24.3
Just (Barbour)	0	2	4	-15.5	-13.5	-11.5	-9.7	-29	-27.25	-46.5	17.5	-2
Kirnberger II	0	2	4	-5	-14	-12	-10	-10	-8	-8	-4	-2
Kirnberger III	0	-3.5	-7	-10.5	-14	-12	-10	-10	-8	-6	-4	-2
Lucy (John Harrison's 31-note Mean Tone)	0	-4.5	-9	-13.5	-18	-22.5	-27	-31.5	-36	13.5	9	4.5
Modified Mean Tone	0	-3.5	-7	-10.5	-14	-15	-15	-15	-3	9	5	1

	C+0	C#+0	D+0	Eb+0	E-0	F+0	F#+0	G+0	G#+0	A+0	Bb+0	B+0
Neidhardt I (1724)	0	-2	-4	-6	-8	-8	-8	-6	-4	-4	-4	-2
Nigel Taylor (Idealised Circulating Temperament)	0	-3	-6	-9	-12	-10	-10	-8	-6	0	-2	-2
Pietro Aaron (1/4 Comma Mean Tone) (1523)	0	-2	-7	-7	-14	-12	-14	-24	-18	10	5	3.5
Ptolemaic (Just)	0	2	4	-16	-14	-12	-10	12	14	16	-4	-2
Pythagorean (Arnout van Zwolle 15c.)	0	2	4	6	8	10	-12	-10	-8	-6	-4	-2
Rossi (1/5 Comma Mean Tone)	7	-9.4	2.3	14.1	-2.4	9.4	-7.1	4.7	-11.7	0	11.7	-4.7
Rossi (1/9 Comma Mean Tone)	8.5	-11.3	2.8	17.0	-2.8	11.3	-8.5	5.7	-14.1	0	14.1	-5.7
Salinas (1/3 Comma Mean Tone)	0	-3.2	-10.5	-16	-20.8	-34	-31.3	-36.5	-41.8	16	10.5	5.2
Silbermann (1/6 Comma Mean Tone)	0	27.3	28.5	51.8	-10	-8.5	-7.2	-26	-26.8	0.5	24	24.8
Vallotti	0	-2	-4	-6	-8	-10	-8	-6	-4	-2	0	2
Van Biezen	5.8	0	2	3.9	-1.9	7.8	-1.9	3.9	1.9	0	5.9	-3.9
Werckmeister III (1691)	0	-4	-8	-12	-10	-8	-12	-10	-8	-6	-4	-2
Werckmeister IV	0	-6	-4	-10	-8	-14	-12	-18	-16	-6	4	-2
Werckmeister V	0	2	4	0	-4	-2	0	-4	-8	0	2	4
Werckmeister VI	0	-1.5	-12.5	-7.5	-5.5	-3.5	-5	-9.5	-7.5	-2.5	-0.5	-2
William Hawkes Modified Mean Tone (1807)	0	-2	-5	-7	-9	-12	-14	-16	-14	-5	5	2
Young I (Idealised Well Temperament) 1799	0	-2	-4	-6	-8	-8	-8	-6	-4	-2	0	0
Young II 1800	0	-2	-4	-6	-8	-14	-12	-10	-8	-6	-4	-2

The grey fields indicate converted values from Hz, might not be 100% accurate.

If you wish to calculate frequencies from the table above, here is a useful formula to do all this.

$$hertz = 2^{\frac{C}{1200}+O+\frac{N}{12}} * REF$$

or the other way:

$$cent = 1200 * \log_2 \frac{H}{REF} - O - \frac{N}{12}$$

where

C is the value to be calculated or converted in cents

H is the value to be calculated or converted in Hertz

O is the value of the octave transposed from the reference 'a' note, where the desired note is located (e.g. if 'a1' is the reference, 0 for a 'c1', +1 for a 'd2', -1 for a 'g#0', etc.)

N is the number of half-notes from the reference note ('a') in the interval of one octave (values from -9 to 2: e.g. -9 for a 'c', -8 for a 'c#', etc., 0 for an 'a', 1 for an 'a#' and 2 for a 'b' regardless of its octave)

REF is the frequency in Hertz of the reference 'a1' note of the scale (e.g. 440 Hz, 415 Hz, etc.)

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- give concerts with them;
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- represent the name of Matthias Church (and its other names) and Notre Dame de Kispest (and its other names) on your recordings, product, film score, or whatsoever;
- use the samples in any electronic organs;
- build any kind of instruments using this library.

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Credits

Csaba Huszty
NDB architect and lead engineer

Szabolcs Varga
managing director
Shirokuma Ltd.

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